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EXAMINER	
LELE, TANMAY S	
ART UNIT	**PAPER NUMBER**
2684	20

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/253,976	KIM ET AL.
	Examiner	Art Unit
	Tanmay S Lele	2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 January 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-4,9,13,17 and 19-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,9,13,17,19,20,23 and 24 is/are rejected.

7)☒ Claim(s) 3,4,21,22,25 and 26 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 16 June 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 22 January 2004 have been fully considered but they are not persuasive.

2. In response to applicant's argument that "[the references]... in no way relate to switching transmission antennas n a cycle that will ensure an entire code length is transmitted from the currently selected antenna; having the switching cycle equal integer multiple of the code length, by definition, provides that the current antenna will transmit for the code length," a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Regarding claims 1, 13, 17, 19, and 23, Applicant attempts to overcome the rejection by stating, "Gibson merely discloses that: a receiver must be synchronized within one chip in order to properly receive a signal," and further that, "This is in no way related to switching transmission antennas in a cycle that will ensure an entire code length is transmitted from the currently selected antenna; having the switching (i.e. transmission) cycle equal to an integer multiple of the code length, by definition, provides that the current antenna will transmit for the code length." Examiner respectfully disagrees with Applicant. Note that Rappaport (page 276, paragraph 1), states a pseudo-noise sequence (a code) comprises of chips. This sequence of

chips (code) is multiplied by the information to create a wide-band coded information signal (paragraph 2 and Figure 5.50). Continuing in paragraph 2, Rappaport further states that the transitions of data symbols and chips coincide such that the ratio of the symbol period and chip period equal an integer. Continuing, Rappaport illustrates that if code synchronization occurs (ie the same code at the transmitter is at the receiver, Figure 5.4, and paragraph 3) the information signal, $s_1(t)$ is recovered (continued in paragraph 3 on page 277). Gibson further supports this notion, as stated by Applicant, in that the chip time of the pseudo-noise sequence (code) must be within one chip time of the received signal (if not, the codes are different and the multiplication would not correlate as per the results seen in Goldman, page 201, and Rappaport, page 277). Hence, as stated in the previous Office Action (paper number 16, page 5 for example), Rappaport (and Gibson) would require "the switching cycle to be an integer multiple of the code length" for the system to function, else code synchronization would be a problem. This follows additionally from the fact that the codes described in Zehavi, Rappaport, and Gibson (for example Zehavi: column 2, lines 54 –65 and column 3, lines 59 –67; Rappaport: paged 276 –278; and Gibson: page 201 – 202; note that Rappaport and Gibson are describing a direct sequence spread spectrum, like that of Zehavi's), in order to perform their functions properly (correlation and autocorrelation for example) are required to exhibit certain properties (as noted in the previous Office Action, paper number 16, page 5 for example) and hence a portion of a code (a non-integer multiple) would not perform as whole code (or integer multiple), as a portion of a code no longer exhibits the proper mathematical properties to perform the functions described in Zehavi, Rappaport, and Gibson (as commonly known in the art). Hence, Examiner is not

persuaded by Applicant's arguments that the cited prior art, when combined for the cited motivation, do not teach or recite the claimed as broadly interpreted.

Allowable Subject Matter

3. Claims 3, 4, 21, 22, 25, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 3, 21, and 25, the present invention is of wherein the controller and the method comprises: a reference cycle storage for storing a reference switching cycle value; a counter for counting clock pulses of a base station and outputting a counted value based on the reference switching cycle value; a memory for storing a plurality of switching patterns and outputting one of said plurality of switching patterns based on the counted value; and a control signal generator for generating the switch controlling signal according to the switching pattern selected from the memory. The closest prior art, Smith et al (Smith, US Patent No 6,006,075) in view Zehavi (Zehavi, US Patent No. 6,185,199) in further view of Rappaport (Rappaport, "Wireless Communications," Prentice Hall Publications) teach of a memory for storing a plurality of switching patterns and outputting one of said plurality of switching patterns, but alone or in combination with other prior art, do not specifically teach of wherein the controller comprises: a reference cycle storage for storing a reference switching cycle value; a counter for counting clock pulses of a base station and outputting a counted value based on the reference switching cycle value; [a memory for storing a plurality of switching patterns and outputting one of said plurality of switching patterns based] on the counted value; and a control signal generator

for generating the switch controlling signal according to the switching pattern selected from the memory.

Claims 4, 22, and 26 are objected to for at least those reasons as in dependent claims 3, 21, and 25.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 19, 20, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (Smith, US Patent No 6,006,075) in view Zehavi (Zehavi, US Patent No. 6,185,199) in further view of Rappaport (Rappaport, "Wireless Communications," Prentice Hall Publications).

Regarding claim 1, Smith teaches of a transmitting apparatus comprising: a signal generator (Figures 4 – 6); at least two transmit antennas (Figures 4 – 6); at least two RF transmitters (Figures 4 – 6), each of the RF transmitters operatively coupled to a respective one of the antennas, for converting the signal generated by the signal generator to an RF signal and outputting the RF signal through the respective antennas (Figure 6 and column 1, lines 13 – 33); and a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity (TSTD) (Figure 6 and column 11, lines 13 – 33 and column 12, lines 58 – 67).

Smith does not specifically teach of wherein the switching cycle is integer multiple of the code length having predetermined code length; for a code division multiple access CDMA communication system; and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code.

In a related art dealing with diversity, Zehavi teaches of for a code division multiple access CDMA communication system (column 4, lines 42 – 48) and again of a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity (TSTD) (column 6, lines 32 – 40).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith's diversity system, Zehavi's diversity provisions, for the purposes of providing a time delayed version of the signal as a diversity scheme (note that Zehavi accomplishes this with a memory delay buffer, while Smith's structure achieves this using the switch, which cannot change instantaneously as stated in Smith, column 12, lines 58 – 67).

Smith in view of Zehavi do not specifically teach of wherein the switching cycle is integer multiple of the code length having predetermined code length and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code.

In a related art dealing with engineering systems, Rappaport teaches of wherein the switching cycle is integer multiple of the code length having predetermined code length (pages 274 – 278; note that synchronization could not occur if the code was not an integer multiple of the code length, due to the nature of the PN codes used in such CDMA systems in relation to synchronization and demodulation as known in the art, for example, Gibson's "Communications Handbook," pages 200 – 202; note further that this correlates to the descriptions of the system's

operation as provided in Applicant's specification, starting pages 15, line 15 and ending page 16, line 3, and again on page 18 where a complete code is used per user; further in Rappaport pages 521-524 and 527 –532; tables 10.4 and 10.6 for the forward and reverse links for example; mathematical properties of such sequences are seen in Gibson, pages 93 – 103) and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code (page 276, section 5.10.2).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith and Zehavi's diversity scheme, Rappaport's finite in length and non-return zero codes, for the purposes of being able to decode and demodulate signals properly without interference from other users, as taught by Rappaport.

Regarding claim 2, Smith in view of Zehavi and Rappaport teach all the limitations as recited in claim 1. Smith further teaches of the time switching transmission controller comprising of a controller having pre-stored switching patterns (column 7, lines 31 – 44), for generating a switch controlling signal based on one of the pre-stored switching patterns (column 11, lines 28 – 33) said controlling signal being generated at the fixed non-overlapping predetermined time interval (column 12, lines 52 – 57; implies as systems using GSM and TDMA, both requiring non-overlapped time frames) a switch connected between an output terminal of the spreader and an input terminal each of the plurality of RF transmitters, for switching the output of the spreader to a corresponding RF transmitter based on the switch controlling signal (as noted in claim 1, Smith in view of Zehavi).

Regarding claims 19 and 23, Smith teaches of a transmitting apparatus and method in a mobile communication bate system (Figures 4 – 6), comprising: a signal generator (Figures 4 –

6); two or more transmit antennas (Figures 4 – 6); two or more RF transmitters (Figures 4 – 6), each of the RF transmitters connected to a respective one of the antennas (Figures 4 – 6), for converting the signal generated by the signal generator to an RF signal and outputting the RF signal through the respective antenna (Figure 6 and column 1, lines 13 – 33); and a time switching transmission controller for alternately switching the transmission signal to one of the RF transmitters for a fixed, non-overlapping predetermined time unit to provide time switching transmission diversity (TSTD) (Figure 6 and column 11, lines 13 – 33 and column 12, lines 58 – 67).

Smith does not specifically teach of code division multiple access CDMA; for generating a transmission signal by modulating +l or -1 signal with a code having predetermined code length; wherein the switching cycle of the controller is an integer multiple of the code length.

In a related art dealing with diversity, Zehavi teaches of for a code division multiple access CDMA communication system (column 4, lines 42 – 48) and again of a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity (TSTD) (column 6, lines 32 – 40).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith's diversity system, Zehavi's diversity provisions, for the purposes of providing a time delayed version of the signal as a diversity scheme (note that Zehavi accomplishes this with a memory delay buffer, while Smith's structure achieves this using the switch, which cannot change instantaneously as stated in Smith, column 12, lines 58 – 67).

Smith in view of Zehavi do not specifically teach of wherein the switching cycle is integer multiple of the code length and for generating a modulation signal by multiplying +1 or -

1 signal with a code spreader for spreading a code and [a code] having predetermined code length.

In a related art dealing with engineering systems, Rappaport teaches of wherein the switching cycle is integer multiple of the code length (pages 274 – 278; note that synchronization could not occur if the code was not an integer multiple of the code length, due to the nature of the PN codes used in such CDMA systems in relation to synchronization and demodulation as known in the art, for example, Gibson's "Communications Handbook," pages 200 – 202; note further that this correlates to the descriptions of the system's operation as provided in Applicant's specification, starting pages 15, line 15 and ending page 16, line 3, and again on page 18 where a complete code is used per user), for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code (page 276, section 5.10.2), and [a code] having predetermined code length (further in Rappaport pages 521-524 and 527 – 532; tables 10.4 and 10.6 for the forward and reverse links for example; mathematical properties of such sequences are seen in Gibson, pages 93 – 103).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith and Zehavi's diversity scheme, Rappaport's finite in length and non-return zero codes, for the purposes of being able to decode and demodulate signals properly without interference from other users, as taught by Rappaport.

Regarding claims 20 and 24, Smith in view of Zehavi and Rappaport teach all the limitations as recited in claims 19 and 23. Smith further teaches of the time switching transmission controller comprising of a controller having pre-stored switching patterns (column 7, lines 31 – 44), for generating a switch controlling signal based on one of the pre-stored

switching patterns (column 11, lines 28 – 33) said controlling signal being generated at the fixed non-overlapping predetermined time interval (column 12, lines 52 – 57; implies as systems using GSM and TDMA, both requiring non-overlapped time frames) a switch connected between an output terminal of the spreader and an input terminal each of the plurality of RF transmitters, for switching the output of the spreader to a corresponding RF transmitter based on the switch controlling signal (as noted in claims 19 and 23, Smith in view of Zehavi).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (Smith, US Patent No 6,006,075) in view Zehavi (Zehavi, US Patent No. 6,185,199) in further view of Rappaport (Rappaport, "Wireless Communications," Prentice Hall Publications) and in further view of Madhow et al. (Madhow, US Patent No. 6,175,587).

Regarding claim 9, Smith teaches of a transmitting apparatus comprising: a signal generator (Figures 4 – 6); first and second transmit antennas (Figures 4 – 6); at first and second RF transmitters (Figures 4 – 6), each of the RF transmitters operatively coupled to a respective one of the antennas, for converting the signal generated by the signal generator to an RF signal and outputting the RF signal through the respective antennas (Figure 6 and column 1, lines 13 – 33); and a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity (TSTD) (Figure 6 and column 11, lines 13 – 33 and column 12, lines 58 – 67); a receiver for receiving the RF signal transmitted through the antennas (column 7, lines 23 – 30); and a controller for alternatively selecting [frequency] according to the switching cycle to support the TSTD reception (starting column 9, line 59 and ending column 10, line 7) and a demodulator for

detecting the modulation signal according to the selection of the controller (starting column 9, line 59 and ending column 10, line 7).

Smith does not specifically teach of wherein the switching cycle is integer multiple of the code length; for a code division multiple access CDMA communication system; and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code having a predetermined code length; the receiver at least comprising first pilot demodulator for estimating a phase of the first pilot signal transmitted through the first antenna and second pilot demodulator for estimating a phase of the second pilot signal transmitted from the second antenna; [a controller for alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception]; and [a demodulator for detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection of the controller (note the brackets are for clarity in grammar and that theses limitations have been addressed in the cited reference).

In a related art dealing with diversity, Zehavi teaches of for a code division multiple access CDMA communication system (column 4, lines 42 – 48) and again of a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity (TSTD) (column 6, lines 32 – 40).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith's diversity system, Zehavi's diversity provisions, for the purposes of providing a time delayed version of the signal as a diversity scheme (note that Zehavi accomplishes this with a memory delay buffer, while Smith's structure achieves this using the switch, which cannot change instantaneously as stated in Smith, column 12, lines 58 – 67).

Smith in view of Zehavi do not specifically teach of wherein the switching cycle is integer multiple of the code length and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code; the receiver at least comprising first pilot demodulator for estimating a phase of the first pilot signal transmitted through the first antenna and second pilot demodulator for estimating a phase of the second pilot signal transmitted from the second antenna; or [a controller for alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception]; and [a demodulator for detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection of the controller] and [a code] having a predetermined code length (note the brackets are for clarity in grammar and that theses limitations have been addressed in the cited reference).

In a related art dealing with engineering systems, Rappaport teaches of wherein the switching cycle is integer multiple of the code length (pages 274 – 278; note that synchronization could not occur if the code was not an integer multiple of the code length, due to the nature of the PN codes used in such CDMA systems in relation to synchronization and demodulation as known in the art, for example, Gibson's "Communications Handbook," pages 200 – 202; note further that this correlates to the descriptions of the system's operation as provided in Applicant's specification, starting pages 15, line 15 and ending page 16, line 3, and again on page 18 where a complete code is used per user), for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code (page 276, section 5.10.2), and [a code] having a predetermined code length (further in Rappaport pages 521-524 and 527 –

532; tables 10.4 and 10.6 for the forward and reverse links for example; mathematical properties of such sequences are seen in Gibson, pages 93 – 103).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith and Zehavi's diversity scheme, Rappaport's finite in length and non-return zero codes, for the purposes of being able to decode and demodulate signals properly without interference from other users, as taught by Rappaport.

Smith in view of Zehavi and Rappaport do not specifically teach of the receiver at least comprising first pilot demodulator for estimating a phase of the first pilot signal transmitted through the first antenna and second pilot demodulator for estimating a phase of the second pilot signal transmitted from the second antenna; or [a controller for alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception]; and [a demodulator for detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection of the controller (note the brackets are for clarity in grammar and that theses limitations have been addressed in the cited reference).

In a related art dealing interference suppression in CDMA systems, Madhow teaches of the receiver at least comprising first pilot demodulator for estimating a phase of the first pilot signal transmitted through the first antenna and second pilot demodulator for estimating a phase of the second pilot signal transmitted from the second antenna (starting column 4,line 66 and ending column 5,line 5 and column 5, lines 21 – 25); or [a controller for alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception] (starting column 4,line 66 and ending column 5,line 5 and column

5, lines 21 – 25); and [a demodulator for detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection of the controller] (starting column 4,line 66 and ending column 5, line 5 and column 5, lines 21 – 25).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith, Zehavi, and Rappaport's diversity system, Madhow's pilot and phase estimation processes, for the purposes of interference suppression between the various signals, as taught by Madhow.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (Smith, US Patent No 6,006,075) in view of Rappaport (Rappaport, "Wireless Communications," Prentice Hall Publications).

Regarding claim 13, Smith teaches of a channel signal transmitting method in a mobile communication system, comprising the steps of: generating a modulation signal (Figures 4 – 6 and column 6, lines 47 – 58); switching the modulation signal to a first RF transmitter connected to a first antenna or a second RF transmitter connected to a second antenna with non-overlapping time intervals (starting column 9, line 59 and ending column 10, line 7 and column 12, lines 52 – 68); and converting the modulation signal to a radio frequency(RF) signal to transmitting the RF signal through one of the antennas (Figures 4 – 6 and column 6, lines 47 – 64)

Smith does not specifically teach of code division multiple access (CDMA); generating a modulation signal by modulating +1 or -1 signal with a code having a predetermined length; wherein a cycle of the switching is multiple integer of the code length.

In a related art dealing with engineering systems, Rappaport teaches of code division multiple access (CDMA) (pages 336 – 338); wherein the switching cycle is integer multiple of

the code length (pages 274 – 278; note that synchronization could not occur if the code was not an integer multiple of the code length, due to the nature of the PN codes used in such CDMA systems in relation to synchronization and demodulation as known in the art, for example, Gibson's "Communications Handbook," pages 200 – 202; note further that this correlates to the descriptions of the system's operation as provided in Applicant's specification, starting pages 15, line 15 and ending page 16, line 3, and again on page 18 where a complete code is used per user) and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code (page 276, section 5.10.2) and [a code] having predetermined code length (further in Rappaport pages 521-524 and 527 –532; tables 10.4 and 10.6 for the forward and reverse links for example; mathematical properties of such sequences are seen in Gibson, pages 93 – 103).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith's diversity system, Rappaport's finite in length and non-return zero codes, for the purposes of being able to accommodate for CDMA systems and further decode and demodulate signals such signals properly without interference from other users, as taught by Rappaport.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (Smith, US Patent No 6,006,075) in view of Rappaport (Rappaport, "Wireless Communications," Prentice Hall Publications) in further view of Madhow et al. (Madhow, US Patent No. 6,175,587).

Regarding claim 17, Smith teaches of a channel signal transmitting method in a mobile

communication system, comprising the steps of: generating a modulation signal (Figures 4 – 6 and column 6, lines 47 – 58); switching the modulation signal to a first RF transmitter connected to a first antenna or a second RF transmitter connected to a second antenna with non-overlapping time intervals (starting column 9, line 59 and ending column 10, line 7 and column 12, lines 52 – 68); and converting the modulation signal to a radio frequency(RF) signal to transmitting the RF signal through one of the antennas (Figures 4 – 6 and column 6, lines 47 – 64) receiving the RF signal transmitted through the antennas (column 7, lines 23 – 30); alternatively selecting the [frequency] according to the switching cycle to support the TSTD reception (starting column 9, line 59 and ending column 10, line 7) and [detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection] (starting column 9, line 59 and ending column 10, line 7).

Smith does not specifically teach of code division multiple access (CDMA); generating a modulation signal by modulating +1 or -1 signal with a code having predetermined code length; wherein a cycle of the switching is multiple integer of the code length; or estimating a phase of the first pilot signal transmitted through the first antenna and a phase of the second pilot signal transmitted from the second antenna; [alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception]; and [detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection] (note the brackets are for clarity in grammar and that theses limitations have been addressed in the cited reference).

In a related art dealing with engineering systems, Rappaport teaches of code division multiple access (CDMA) (pages 336 – 338); wherein the switching cycle is integer multiple of

the code length (pages 274 – 278; note that synchronization could not occur if the code was not an integer multiple of the code length, due to the nature of the PN codes used in such CDMA systems in relation to synchronization and demodulation as known in the art, for example, Gibson's "Communications Handbook," pages 200 – 202; note further that this correlates to the descriptions of the system's operation as provided in Applicant's specification, starting pages 15, line 15 and ending page 16, line 3, and again on page 18 where a complete code is used per user) and for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a code (page 276, section 5.10.2) and [a code] having predetermined code length (further in Rappaport pages 521-524 and 527 –532; tables 10.4 and 10.6 for the forward and reverse links for example; mathematical properties of such sequences are seen in Gibson, pages 93 – 103).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith's diversity system, Rappaport's finite in length and non-return zero codes, for the purposes of being able to accommodate for CDMA systems and further decode and demodulate signals such signals properly without interference from other users, as taught by Rappaport.

Smith in view of Rappaport do not specifically teach of estimating a phase of the first pilot signal transmitted through the first antenna and a phase of the second pilot signal transmitted from the second antenna; [alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception]; and [detecting the modulation signal] with the first estimated phase or the second estimated phase

[according to the selection] (note the brackets are for clarity in grammar and that theses limitations have been addressed in the cited reference).

In a related art dealing interference suppression in CDMA systems, Madhow teaches of estimating a phase of the first pilot signal transmitted through the first antenna and a phase of the second pilot signal transmitted from the second antenna (starting column 4, line 66 and ending column 5, line 5 and column 5, lines 21 – 25); [alternatively selecting] the first estimated phase or the second estimated phase [according to the switching cycle to support the TSTD reception] (starting column 4, line 66 and ending column 5, line 5 and column 5, lines 21 – 25); and [detecting the modulation signal] with the first estimated phase or the second estimated phase [according to the selection] (starting column 4, line 66 and ending column 5, line 5 and column 5, lines 21 – 25).

It would have been obvious to one skilled in the art at the time of invention to have included into Smith and Rappaport's diversity system, Madhow's pilot and phase estimation processes, for the purposes of interference suppression between the various signals, as taught by Madhow.

Citation of Pertinent Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Inventor	Publication	Number	Disclosure
Yang	Artech House	Pages 46 – 51	Walsh code generation and channelization

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tanmay S Lele whose telephone number is (703) 305-3462. The examiner can normally be reached on 9 - 6:30 PM Monday – Thursdays and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay A. Maung can be reached on (703) 308-7745. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Tanmay S Lele
Examiner
Art Unit 2684

tsl
April 5, 2004

NAY MAUNG
SUPERVISORY PATENT EXAMINER